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#20 Coalinga Asbestos
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PRESENTATION - APRIL 29, 1982

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

Asbestos Tailings Pile

Coalinga Asbestos Co.

by

J. A. GOODWIN
MANVILLE CORP.

RON BATTLES
MANVILLE CORP.

R. L. PARRATT, LAND MANAGER
SOUTHERN PACIFIC LAND CO.

OBJECTIVE

To minimize asbestos fibers originating in the northwest corner of Section I from entering the local stream system.

The existing drainage patterns lead into and under the Coalinga Asbestos Company tailings pile. There is no water flow in the dry summer months, but during the winter rainy season water does flow in and around the subject pile.

What we will propose here is a method of reducing the drainage pattern that directly effects the pile and filtering the portion that does effect the pile prior to entering the drainage streams using an earthen dam.

THE COMPLAINT

During the spring of 1980, high levels of asbestos fibers had been discovered in the California Aquaduct.

Subsequent upstream tracing has identified White Creek and several of its tributaries as the probable source.

On October 15, 1980 a "Compliance Inspection" by the CRWQCB in the Coalinga area was undertaken. The land owner was represented in this visit by Ralph Bisset, Fresno representative for the S.P. Land Co., and David Long, attorney for Southern Pacific. Joe Jeno of Dames & Moore was also present.

A report was prepared by Arnold Hatari describing his observations and recommendations.

This report will detail the implementation of our compliance.

HISTORICAL BACKGROUND

In Western Fresno County the uplift of the coast range has yielded a massive localized "plug" of asbestos-rich serpentine that measure about 4 miles by 14 miles.

Three companies have mined this asbestos deposit: Atlas Minerals, Coalinga Asbestos Co., and Union Carbide. Only Union Carbide is still operational.

The Mistake Mine, about ½ mile northwest of the Coalinga Asbestos Co. mill, mined chrome ore; but, its overburden material was mostly asbestos.

Coalinga Asbestos Co. started producing in 1962. Tailings from the mill during the twelve years of production were placed on the floor of Pine Canyon. The total tailings are estimated to be about 250,000 tons.

The Coalinga Asbestos Co. recognized during its years of operation that its own operations should not increase the asbestos that was getting into the local stream from the natural deposits. Measures were taken

to prevent possible additional contamination. The principal steps taken were to reduce erosion by run-off diversion and by constructing a filtration dam downstream.

The last operational agency inspection was on January 7, 1974, by Joe A. O'Donnel and E. D. Armstrong, who commented:

> "At the base (of the tailings pile), the dam is approximately 50 feet thick. Some water seeps through but the soils should function as an efficient filter.
>
> Coalinga Asbestos is not causing a nuisance or pollution at this time, and is, therefore in compliance with existing waste discharge requirements."

See Appendix I for copy of the memo.

In 1975 Coalinga Asbestos Co. assigned its mill area lease to Marmac Resource Co., 552 West 127th Street, Los Angeles, California, 90004. Coalinga Asbestos Co. also sold Marmac the mill building and all equipment. Subsequent changes in the lease between Marmac and Southern Pacific generally decreased the area of Marmac's leasehold.

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GEOGRAPHY

The subject asbestos deposit is immense[1] with surface exposure of over fifty square miles. To date, only the top 50 to 100 feet have been explored; but, even this shallow depth would yield hundreds of millions of tons of asbestos fiber.

There is a second large area known as the "Big Blue Member" of the Temblon Formation which outcrops in the hills north of Coalinga. This deposit slopes to the east and drains into the Central Valley.

Coalinga Asbestos Co. has disturbed about 100 acres during the mining period and the subject tailings pile is about eight acres in surface exposure; so, the Coalinga Asbestos Co. tailings pile is a miniscule part of the whole picture.

The stream system near the pile has no run-off during this summer and only minor flows during most normal winters. But the Pine Canyon wash does discharge into White Creek when flow is sustained during the winter months. White Creek drains the Atlas Minerals Co. plant and mine area.

[1]Division of Mines and Geology
Volume 16, Number 9, September 1963.

Coalinga Asbestos Fiber
Canadian Mining Journal, Vol. 83, No. 8
August 1962
By: R. C. Munro and K. M. Reins

PRESENT CONDITIONS

The subject tailings pile contains about 250,000 tons of asbestos waste. Its surface exposure is roughly eight acres.

The pile was constructed by pushing material with a bulldozer over a continually moving bank, so the bulk of the pile is flat while the balance slopes downstream at its normal angle of repose.

As noted in Hatari's report, two large water retention panels have been excavated on the flat portion of the pile. The surface of the pile has crusted over in the normal fashion for asbestos fiber, as it has a slight cementing action.

Downstream some few hundred yards, an earthen dam has been built to contain storm flows. The dam presently shows signs of having been breached.

About ¼ mile above the pile is a diversion ditch which still shows signs of being effective. This ditch diverts run-off from area #1 (see maps) into an un-named stream bed just west of the mill. This un-named stream has no asbestos tailings.

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There are signs that drainage area #2 has discharged run-off that has run under the tailings pile.

There are also signs that run-off from area #3 has run down to the pile and then worked its way downhill to eventually join the pre-existing stream bed.

It would be drainage from areas #2 and #3 that would contribute to any downstream contamination.

SOLUTIONS

The downstream dam coupled with upstream diversion ditches has worked well in the past. The effectiveness of these measures is evidenced by the agency inspection memorandum of January 7, 1974, and can be corroborated today by visual observation at the dam site. Upstream of the dam there are noticeable white deposits on the surface of the creek bed, but these deposits are not visible downstream of the dam except in the mouth of the breach in the dam. The inert, non-leachable nature of asbestos is recognized both in research studies (Fuller, "Movement of Selected Metals, Asbestos, and Cyanide in Soil: Applications to Waste Disposal Problems", USEPA Study No. 600 2-77-020, 1977) and in California's water regulations, where asbestos is identified as a "nonwater soluble, non-decomposable inert solid" (§2522).

1) We propose to rebuild and enlarge the existing dam in its present location. The completed dam will be 14' high.

2) The diversion ditch described in "Present Conditions" is already operative and has been for many years. We propose to clean it out and enhance its chances for survival.

3) We also propose to construct a new diversion ditch just upstream of the pile that will direct the flow around the pile. This new ditch will substantially reduce water erosion.

Ditch and dam design sizes were calculated using government rainfall frequency charts and the most recent topographical maps (see Appendix).

SCHEDULE

We propose to construct the dam and ditches during the summer of 1982, if the enclosed plan is approved by August 1, 1982.

APPENDIX

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TO: 1. Robert H. Figueroa
2. Darrell J. Smith
3. Louis A. Beck

FROM: Joseph A. O'Donnell

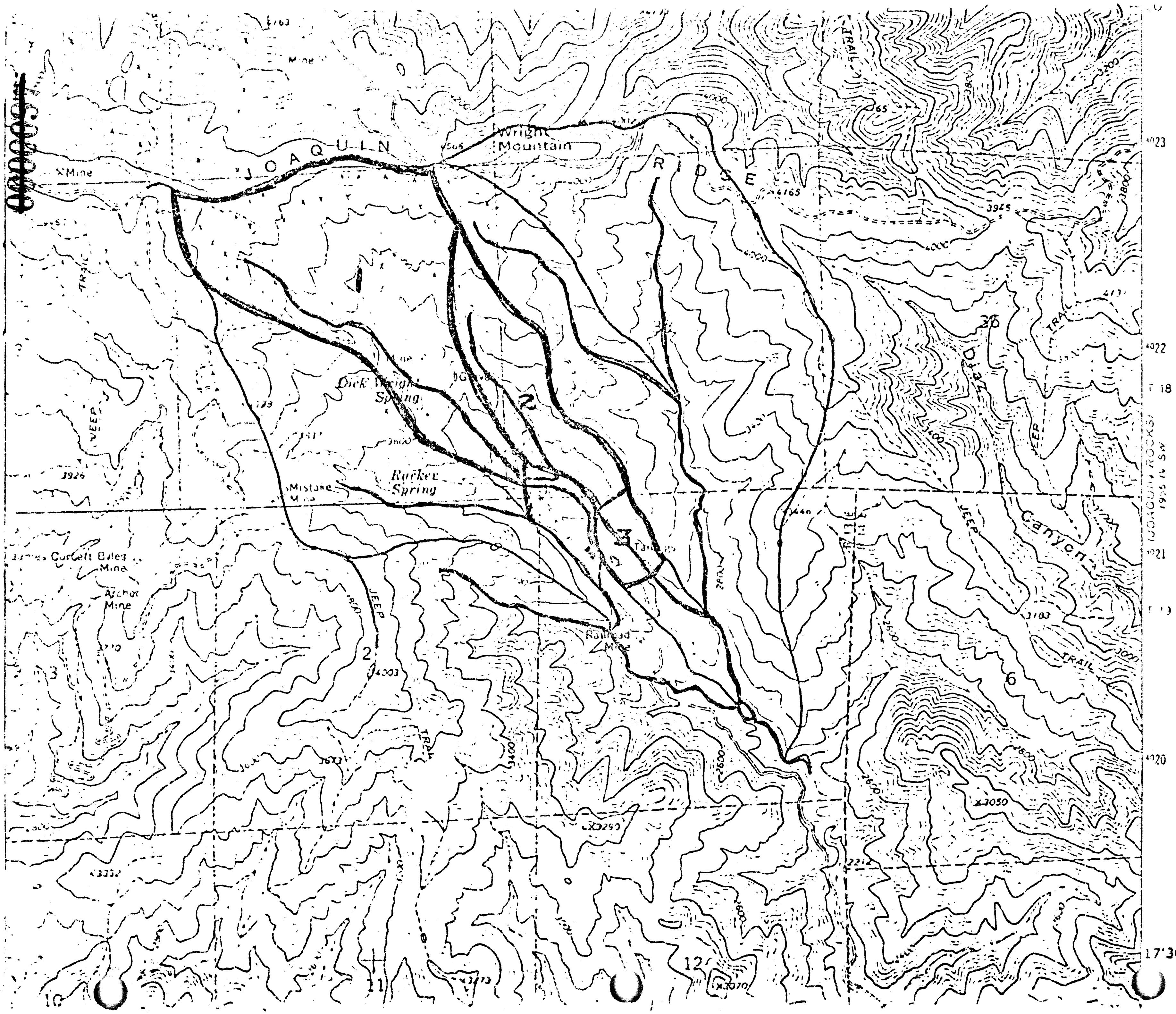
SUBJECT: Coalinga Asbestos, Fresno County

On Thursday, 13 December 1973, Edward S. Armstrong and I inspected the Coalinga Asbestos Company's processing plant. It is located as shown on the attached map. We were accompanied by the plant manager ~~Bobe~~ Jones.

Two sources of possible water pollution exist: The raw material storage area and the waste tailings area. Adequate precautions appear to have be taken to prevent surface water contamination by asbestos fibers. One stream-bed has been rerouted to avoid contact with the raw material storage area . A second stream with a very small drainage area has been dammed to preclude asbestos contact. The waste material is placed in a stream channel. The stream has been dammed a short distance below the tailings. At the base, the dam is approximately 50 feet thick. Some water seeps through but the soils should function as a efficient filter.

Coalinga Asbestos is not causing a nuisance or pollution at this time, and is, therefore in compliance with existing waste discharge requirements.

Joseph A. O'Donnell
Assistant Engineer
7 January 1974



JOAQUIN
RIDGE
Wright Mountain
Mine
Dick Wright Spring
Rucker Spring
Mistake Mine
Anchor Mine
Railroad Mine
Diaz Canyon
JEEP
TRAIL
4165
3945
3926
4003
3050
3290
3332
2212
4023
4022
T 18 S
4021
T 19 S
4020
17'30"
2
3
6
12
35
10
11

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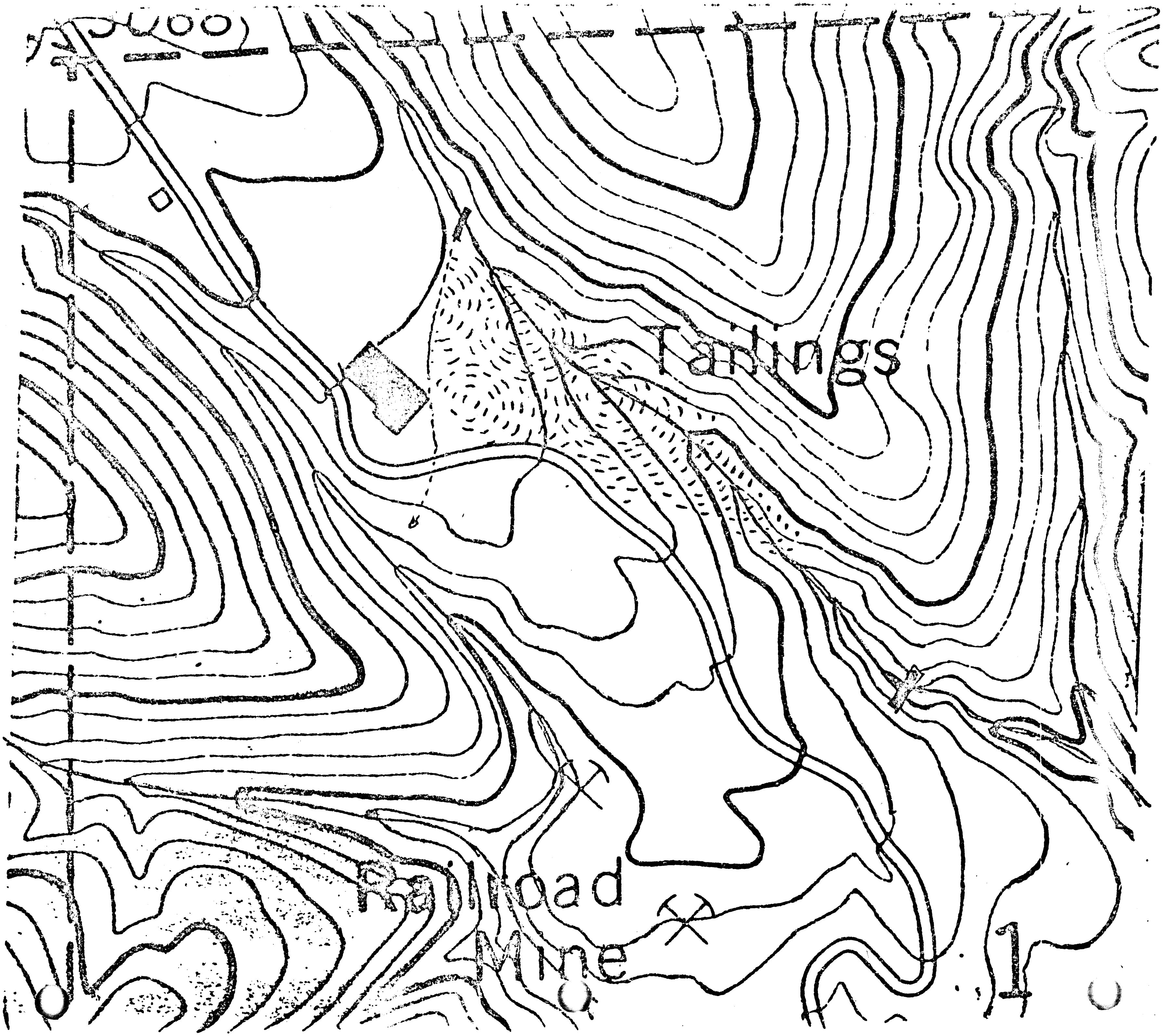

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Johns-Manville

ENGINEERING CALCULATIONS

SUBJECT: WATERSHED AREAS

PROJECT TITLE: COALINGA TAILINGS

PROJECT NO.: 9097

BY LMR

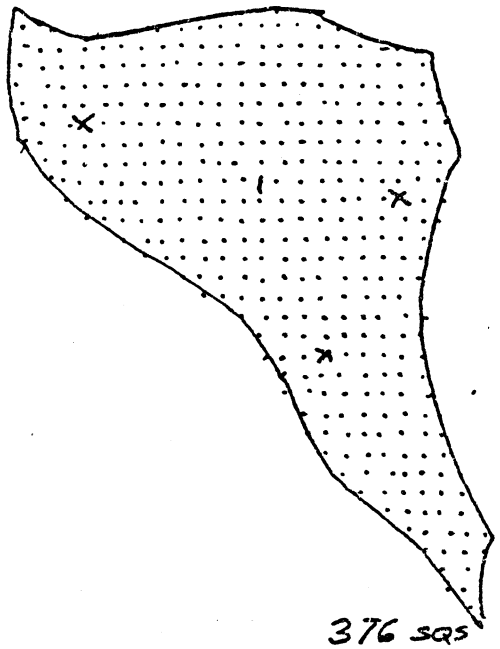
PAGE 1 OF 12

DATE 2-10-82

REVISED

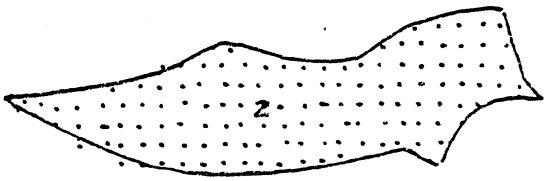
CHECKED:

DATE



1:~~24,000~~

33 SQS
= 37 ACRES



128 SQS
= 142 ACRES

376 SQS
=
376 × 1.11 = 418 ACRES

1 = 2,400 INCHES
= 200 FEET

~~1 = 240,000 INCHES~~
~~= 20,000 FT~~

1 ACRE = 4840 SQ. YDS
= 43,560 SQ FT

□ = 40,000 SQ. FT.
□ = 0.9 ACRES

Johns-Manville	SUBJECT: TABLE OF RAINFALL DATA	BY ZMR
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ENGINEERING CALCULATIONS	PROJECT NO.: 9097	DATE 2-10-82
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RAINFALL DATA

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FREQUENCY	DURATION	AMOUNT	RATE
1 YR	.5 HRS	.3 IN	0.010 IN/MIN
2	.5	.4	0.013
5	.5	N/A	N/A
10	.5	.6	0.020
25	.5	.8	0.027
50	.5	.9	0.030
100	.5	1.0	0.033
1	1	.4	0.007
2	1	.5	0.008
5	1	.6	0.010
10	1	.8	0.013
25	1	1	0.017
50	1	1.2	0.020
100	1	1.3	0.022
1	2	.5	0.004
2	2	.6	0.005
5	2	.9	0.007
10	2	1	0.008
25	2	1.3	0.011
50	2	1.5	0.012
100	2	1.6	0.013
1	3	.7	0.004
2	3	.8	0.004
5	3	1	0.006
10	3	1.3	0.007
25	3	1.5	0.008
50	3	1.6	0.009
100	3	2	0.011

CONTINUED

Johns-Manville	SUBJECT: TABLE OF RAINFALL DATA	BY LMR
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FREQUENCY	DURATION	AMOUNT.	RATE
1	6	.8	0.002
2	6	1	0.003
5	6	1.5	0.004
10	6	2	0.006
25	6	2.3	0.006
50	6	2.4	0.007
100	6	2.7	0.008
1	12	1	0.001
2	12	1.5	0.002
5	12	2	0.003
10	12	2.2	0.003
25	12	2.4	0.003
50	12	2.6	0.004
100	12	3.0	0.004
1	24	1.25	0.001
2	24	1.5	0.001
5	24	2	0.001
10	24	2.7	0.002
25	24	2.9	0.002
50	24	3.1	0.002
100	24	3.4	0.002

* Technical Paper No. 10
Rainfall Frequency Atlas of U.S.
for Durations from 30 min to 24 hr.
and Return Periods from 1 to 100 yrs.
May, 1961

Johns-Manville	SUBJECT: RUNOFF CALCULATIONS	BY LMR
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TOTAL RUNOFF IN CFS. USING 0.033 IN/MIN RATE ~~0000097~~

AREA #1

$$\text{RUNOFF} = \frac{0.033\ \text{IN}}{1\ \text{MIN}} \times \frac{1\ \text{MIN}}{60\ \text{SEC}} \times \frac{1\ \text{FT}}{12\ \text{IN}} \times 418\ \text{ACRE} \times \frac{43{,}560\ \text{FT}^3}{1\ \text{ACRE}} =$$

$$= 834\ \frac{\text{FT}^3}{\text{SEC}}$$

AREA #2

$$\text{RUNOFF} = \frac{0.033\ \text{IN}}{1\ \text{MIN}} \times \frac{1\ \text{MIN}}{60\ \text{SEC}} \times \frac{1\ \text{FT}}{12\ \text{IN}} \times 142\ \text{ACRE} \times \frac{43{,}560\ \text{FT}^3}{1\ \text{ACRE}} =$$

$$= 284\ \frac{\text{FT}^3}{\text{SEC}}$$

AREA #3

$$\text{RUNOFF} = \frac{0.033\ \text{IN}}{1\ \text{MIN}} \times \frac{1\ \text{MIN}}{60\ \text{SEC}} \times \frac{1\ \text{FT}}{12\ \text{IN}} \times 37\ \text{ACRE} \times \frac{43{,}560\ \text{FT}^3}{1\ \text{ACRE}} =$$

$$= 74\ \frac{\text{FT}^3}{\text{SEC}}$$

Johns-Manville	SUBJECT: CALCULATION OF TRENCH DIMENSIONS	BY LMR
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BY MANNING FORMULA

$$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$$

Q = DISCHARGE $\left(\frac{Ft^3}{SEC}\right)$

A = CROSS SECTION AREA (ft^2)

n = COEFFICIENT OF ROUGHNESS

R = $\frac{\text{AREA OF SECTION}}{\text{WETTED PERIMETER}}$ (ft)

S = SLOPE

DIVERSION DITCH #1

$Q = 834 \frac{Ft^3}{SEC}$

$A = ? = aC + 2C^2$

n = 0.03 (COEFFICIENT FOR ROUGH GRADED SURFACE)

$R = ? = \frac{aC + 2C^2}{2a + 4C + 2\sqrt{3}C}$

S = .167

$\therefore Q = A \cdot \frac{1.486}{n} R^{2/3} S^{1/2}$

$$Q = (aC + 2C^2)\frac{1.486}{0.03}\left[\frac{aC + 2C^2}{2a + 4C + 2\sqrt{3}C}\right]^{2/3}\left[.167\right]^{1/2}$$

Johns-Manville	SUBJECT: CALCULATION OF TRENCH DIMENSIONS	BY DMR
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DIVERSION DITCH #2

$Q = 284 \frac{ft^3}{sec}$

$A = ? = ac + 2c^2$

$n = 0.03$

$R = ? \quad \frac{ac + 3c}{2a + 4c + 2\sqrt{3}c}$

$S = 0.077$

$$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$284 = (ac + 2c^2) \frac{1.486}{0.03} \left[\frac{ac + 2c^2}{2a + 4c + 2\sqrt{3}c}\right]^{2/3} [.077]^{1/2}$$

Johns-Manville	SUBJECT: TRENCH DESIGN DIMENSIONS	BY LMR
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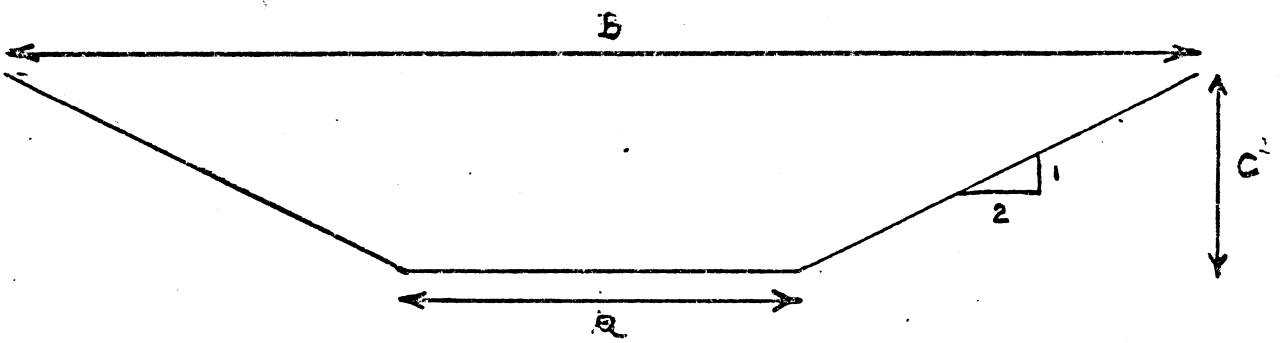

CROSS SECTION AREA OF DITCH:

$$\text{AREA} = (a \times c) + 2c^2$$

NOTE: $b = a + 4c$

SLOPE OF TRENCH:

DIVERSION DITCH #1 $\cong \frac{120'}{720'} = \frac{.167}{1}$

DIVERSION DITCH #2 $\cong \frac{80'}{1040'} = \frac{.077}{1}$

Johns-Manville	SUBJECT: CHART OF POSSIBLE TRENCH DIMENSIONS	BY LMR
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